

What is claimed is:

1. A battery comprising:

- (1) a cylindrical shaped external case having a projection jutting from its inner surface;
- 5 (2) an electrode assembly inserted into the external case; and
- (3) a lead plate, which is connected to the electrode assembly, and which is connected to the projection jutting from the inner surface of the external case by an energy beam applied to the external case from outside the external case.

10 2. A battery as recited in claim 1 wherein the external case is a circular cylindrical shape, and a projection is provided at the center of the bottom plate of the external case.

15 3. A battery as recited in claim 2 wherein a spiral shaped electrode assembly is inserted into the circular cylindrical shaped external case.

20 4. A battery as recited in claim 1 wherein a projection for connection to the lead plate is provided on a side-wall of the external case.

5. A battery as recited in claim 1 wherein the shape of the external case is a rectangular cylinder, an elliptical cylinder, or a cylinder shape between rectangular and elliptical (super-elliptical).

25 6. A battery as recited in claim 5 wherein a spiral shaped electrode assembly is pressed from both sides to deform it into an ellipse and inserted into an elliptical external case.

30 7. A battery as recited in claim 5 wherein an electrode assembly, formed by cutting a plurality of positive electrode plate and negative electrode plate

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sheets and stacking them with separator in between, is inserted into a rectangular cylindrical external case.

5 8. A battery as recited in claim 1 wherein the protruding surface of the projection provided on the external case is curved around the central protrusion.

10 9. A battery as recited in claim 1 wherein the protruding surface of the projection provided on the external case juts out in a conical shape.

15 10. A battery as recited in claim 1 wherein a flexible deforming piece is formed on the lead plate as a result of a U-shaped cut-out around the flexible deforming piece, and the flexible deforming piece is weld attached to the projection on the external case.

20 11. A battery as recited in claim 10 wherein the flexible deforming piece projects outward towards the projection on the external case.

25 12. A battery as recited in claim 10 wherein the external case is circular cylindrical shaped, the lead plate is cut from metal plate in a disk shape smaller than the inside of the external case, and the flexible deforming piece is disposed at the approximate center of the lead plate.

30 13. A battery as recited in claim 12 wherein the lead plate has holes with projections around the peripheries of the holes, and the projections are connected to the electrode assembly.

14. A battery as recited in claim 1 wherein anti-corrosive coating is applied to the region of energy beam application outside the external case.

~~as recited in claim 14 wh~~

add a⁸

λ	λ^2	λ^3	λ^4	λ^5	λ^6	λ^7	λ^8	λ^9	λ^{10}	λ^{11}	λ^{12}	λ^{13}	λ^{14}	λ^{15}	λ^{16}	λ^{17}	λ^{18}	λ^{19}	λ^{20}
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	4	8	16	32	64	128	256	512	1024	2048	4096	8192	16384	32768	65536	131072	262144	524288	1048576
3	9	27	81	243	729	2187	6561	19683	59049	177147	531441	1594323	4782969	14348907	43046721	129139161	387431481	1162294443	3486883329
4	16	64	256	1024	4096	16384	65536	262144	1048576	4194304	16777216	67108864	268435456	1073743104	4294967040	17179869440	68719476736	274877906944	1099521623040
5	25	125	625	3125	15625	78125	390625	1953125	9765625	48828125	244140625	1220703125	6103515625	30517578125	152587890625	762939453125	3814697265625	19073486328125	95367431640625
6	36	216	1296	7776	46656	279936	1679616	10077696	60466176	362793024	2176778112	13060668672	78364012032	470184072192	2821104433184	16926626600096	101559759600576	609358557603456	3656151345621760
7	49	343	2401	16807	117649	823543	5724253	39959723	277678063	1943746441	13606225089	95243575623	666705029361	4666935205529	32668546438703	228679825070921	1600758775496449	11205311428475143	78438180000326001
8	64	512	4096	32768	262144	2097152	16777216	134217728	1073743104	8589967360	68310026752	546480214016	4371841712128	34974733697024	279801869576192	2238414956609536	17907319652876288	143258557223010304	1146068457784082432
9	81	729	6561	59049	531441	4782969	43046721	387431481	3486883329	31381059609	282393536481	2541541828321	22875856454881	205882708093921	1852944372845281	16676500355607041	150088503199863361	1359796528798770241	12418168759188932161
10	100	1000	10000	100000	1000000	10000000	100000000	1000000000	10000000000	100000000000	1000000000000	10000000000000	100000000000000	1000000000000000	10000000000000000	100000000000000000	1000000000000000000	10000000000000000000	100000000000000000000